



# The eccos

ENERGIA E CONSTRUÇÃO SUSTENTÁVEIS



# Network

NASA/C3P Workshop 2010  
Nov 2-4, San Diego, CA







# *What is the*

# ecos

ENERGIA E CONSTRUÇÃO SUSTENTÁVEIS



# *Network?*

- 7 Municipalities
- 40 Stakeholders

## **GOALS:**

Innovative and Competitive Cities  
centered on Energy Efficiency

## **BASED ON:**

- *Sustainable Construction*
- *Renewable Energies*

## **FUNDED BY:**

- Government, Municipalities & Stakeholders



# Vision

## Intelligent Mobilization of Sustainable Energy & Construction

- Build a *networked eco-community* centered on sustainable energy and construction
- To increase accumulation of knowledge, allowing creation of innovative products, services and solutions, complementary among themselves, reproducible in different locations
- Leading to urban development, emergence of new economic functions and international projection of partner cities





San Diego,  
CA, USA

Lisbon,  
Portugal

## 7 ECOS-Networked Municipalities

Promoting:

- Proximity Relationships
- Distance Relationships

### Climates:

- 3 - Mixed Atlantic & Mediterranean
- 3 - Mediterranean w/ Continental influence
- 1 - Mediterranean w/ Maritime influence





# Ongoing ECOS Projects among ECOS Network by Municipality

<b>Óbidos</b>	Eco-Vila	Social Carbon Óbidos	Óbidos Technological Park	
<b>Peniche</b>	Ocean Energy Research Center	Berlenga Sustainable Laboratory	CARSurf	Sustainable Social Housing
<b>Torres Vedras</b>	Eco-Urbe	Mais Boavista	Santa Cruz High School	Environ Educ Center

Sustainable Construction

Renewable Energy

Integrated Projects



# Ongoing ECOS Projects among ECOS Network

<b>Beja</b>	Sustain. Bldg	BioECOS	RH Beja Technology	Solar Sports			
<b>Serpa</b>	Soil Lab & Sustain. Construc.	Sustain. Construc. & Renew Energy Cluster	Eco-Vila	Eco-Quarter	From City to River	Municip Water Heating Systems	Integrated Systems Certific.
<b>Moura</b>	Zero Emission Bldg	Microgen. in Sensitive Urban Environ	Photovolt R&D Unit	Techno Park Managemt . Structure	EcoCoop	Energy Product. Plants via Renew. Sources	SUN FLOWER
<b>Silves</b>	Thermal Solar Energy for Water Heating	Sustain. Rehab of City Heritage Garden	Clean House				

Integrated Projects

Renewable Energy

Sustainable Construction





## Eco-Town



MUNICÍPIO DE  
ÓBIDOS



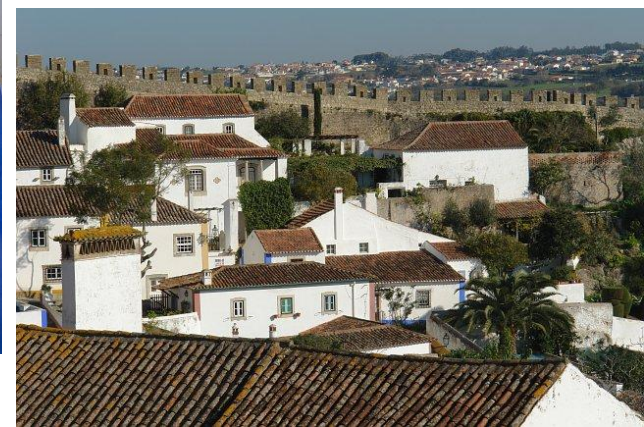
Showcase for Innovative Solutions for Urban Qualification Within Historical Centers



- \* Reduce carbon emissions by 40% until 2020
- \* Reduce energy costs



Integrated within the Program  
“Óbidos Social Carbon”

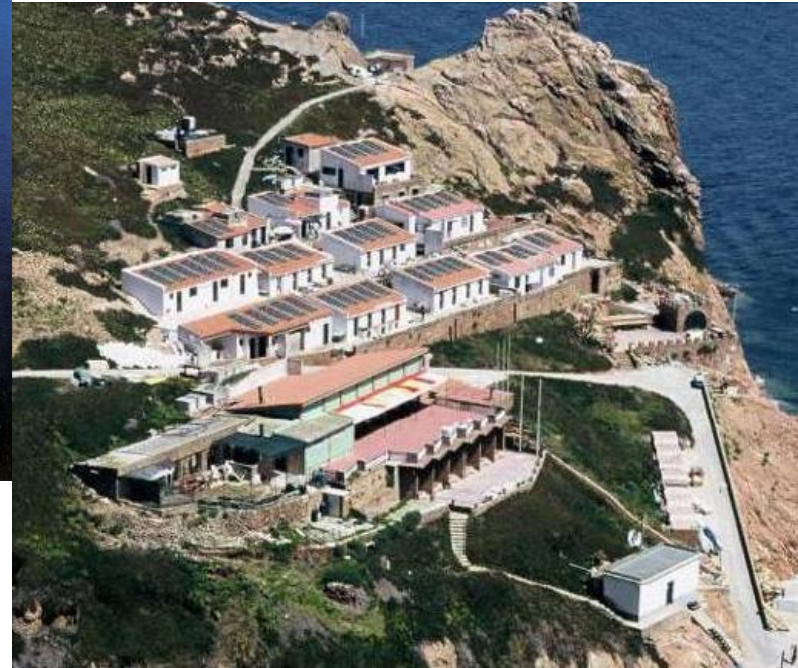




# Berlenga Laboratory of Sustainability



Zero Emissions Island



- \*Improvement of Tourist Infrastructures
- \*Reduction of Ecological Footprint
- \*Promotion of a Sustainable Destination





# Boavista Social Housing Rehabilitation



Built in 1960's:  
Municipal Social Housing  
for families on welfare.



Rehabilitation of social  
housing, introducing  
measures to improve  
energy efficiency and  
technologies for solar  
energy production.



## Santa Cruz Eco-Urbe



*80 m<sup>2</sup> Open Space for Exhibit Area,  
Amphitheatre & Offices.*



Sustainable House:

- \*Passive Construction for Improved Energy Efficiency
- \*Wind & Solar Microgeneration and Water Recycling Systems
- \*Modular Building Design

**Showcase for Sustainable  
Energy Systems,  
Technologies & Equipment**





## Environmental Education Center



Pilot Building in Sustainable Construction

\* Integrating Sustainable and Bioclimate Systems







## Santa Cruz High School

### Sustainable Measures:

#### \*Geothermal system for air conditioning:

- high performance heat pump
- 2 air Treatment units with heat recuperation via enthalpy

#### \*Microgeneration:

- Solar Photovoltaic (sold to grid)
- Solar Heating for water heating

#### \*LED outdoor lighting

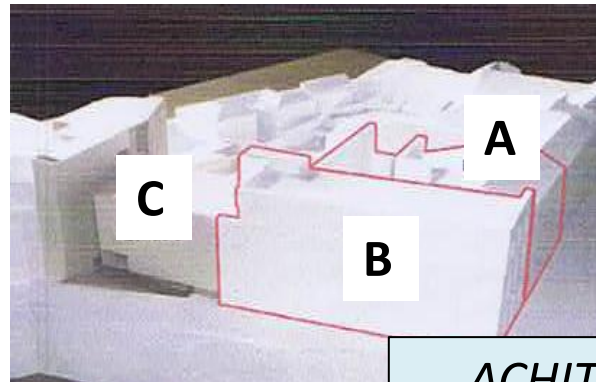
**Estimated annual reduction of 2.3 tons CO<sub>2</sub>**





# Sustainable Municipal Buildings

## Rehabilitation of Services Building in Historical City Center



*ARCHITECTURAL CONCEPT:  
"Integration by contrast"*

Bldg A to be rehabilitated  
Bldg B to be restored  
Bldg C new construction

- \* Zero Carbon building
- \* Reduction in energy costs
- \* Showcase for sustainable technologies





Eco-Quarter

ARCHITECTURAL CONCEPT:  
*"Integration by contrast"*

Rehabilitation of Urban Block in Historical Center



New and Traditional, Energy Efficient  
and Sustainable Building Materials



# Eco-Neighborhood

Rural Residential Cluster Integrating:

- \* Renewable Energy Systems
- \* Energy-Efficient Building Materials & Techniques



Test New Development Paradigm  
With New Urban Planning and  
Zoning Model.







## Zero Emissions Building

Solar Energy Research Lab



Showcase  
Sustainable  
Construction



# Microgeneration in Sensitive Urban Environments



Optimize Energy  
Production with  
Integrated Synergistic  
Systems

Solar Panels  
Mini Wind Turbine  
Hydrogen Fuel Cell

for Production of Electricity, Space and Water Heating.



*Moura's Vertical Gardens*



# Heritage Garden-Park



## Soil Architecture

- \* Algarve traditional brick
- \* Silves red stone



## "Clean House"

**Increase Community Awareness  
of  
Sustainable Construction and  
Renewable Energies**

Solar Panels & Wind Turbine

- \* Lighting
- \* Water heating
- \* Earthquake alarm
- \* TV
- \* Computer
- \* Coffee-machine





Building materials  
made from waste  
products

Energetically  
efficient  
equipments

Cross  
ventilation

Photovoltaic  
energy

Waste  
recycling

Native  
plants

Protection,  
unwanted sunlight

Using natural  
light

Humidity control

Renewable  
materials

Reduced loss of  
materials





## Other ECOS Network Projects Include:

- Hydrogen
- Urban Mobility Systems
- International cooperation with Universities
- International cooperation networks
- Cooperation with Sister Cities

\* ECOS projects are centered on the development of sustainable solutions with ***social interest.***

\* ECOS projects take advantage of Portugal's ***endogenous national resources:***  
Sun, Water & Wind





# Thank you for your attention

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